

Abstract

A low resistance Co silicide layer with less leakage current is formed over the surface of the source and drain of a MISFET by optimizing the film forming conditions and annealing conditions upon formation of Co (cobalt) silicide. Described specifically, low resistance source and drain (n^+ type semiconductor regions, p^+ type semiconductor regions) with less junction leakage current are formed by, upon formation of a Co silicide layer by heat treating a Co film deposited over the source and drain (n^+ type semiconductor regions, p^+ type semiconductor regions) of the MISFET, depositing the Co film at a temperature as low as 200°C or less, carrying out heat treatment in three stages to convert the Co silicide layer from a dicobalt silicide (Co_2Si) layer to a cobalt monosilicide ($CoSi$) layer and then to a cobalt disilicide ($CoSi_2$) layer successively.